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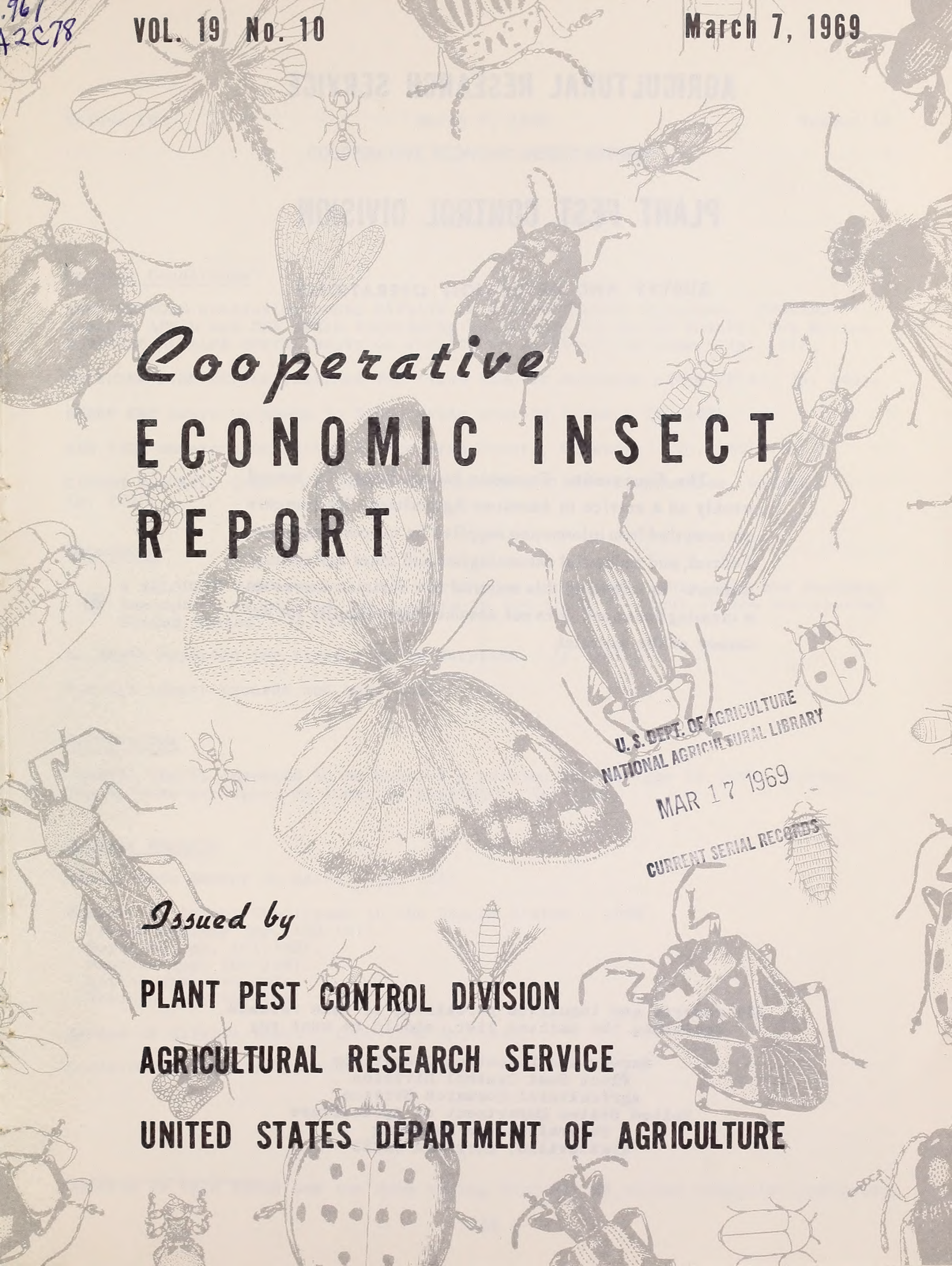

Cooperative ECONOMIC INSECT REPORT

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PLANT PEST CONTROL DIVISION
AGRICULTURAL RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PEST CONTROL DIVISION

SURVEY AND DETECTION OPERATIONS

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearing house and does not assume responsibility for accuracy of the material.

All reports and inquiries pertaining to this release, including the mailing list, should be sent to:

Survey and Detection Operations
Plant Pest Control Division
Agricultural Research Service
United States Department of Agriculture
Federal Center Building
Hyattsville, Maryland 20782

Volume 19 March 7, 1969 Number 10

COOPERATIVE ECONOMIC INSECT REPORT

HIGHLIGHTS

Current Conditions

ARMY CUTWORM destroying young alfalfa in Blaine County, Oklahoma. SPOTTED ALFALFA APHID and PEA APHID increasing in alfalfa in Chaves County, New Mexico. EGYPTIAN ALFALFA WEEVIL heavy on alfalfa in southwest Arizona. (p. 147).

SOUTHERN PINE BEETLE recorded for first time in Arkansas since 1913. (p. 149).

SHEEP KED heavy on sheep in Trans-Pecos area of Texas. (p. 149).

EAR TICK numerous on cattle in Sequoyah County, Oklahoma. (p. 150).

CITRUS BLACKFLY found for the first time since 1966 in Matamoros, Mexico. (p. 150).

Detection

● A EULOPHID WASP reported for first time in Hawaii. This is a new Western Hemisphere record but the species is not known to occur in the continental United States. (p. 152).

An APHID reported for first time in Maryland. (p. 151).

For new county records see page 151.

Predictions

ALFALFA WEEVIL expected to be more of a problem in Michigan in 1969. Larval populations may again be lower in Maryland. (p. 153).

Special Reports

Winter Moth Survey in Maine. (p. 151).

Summary of Insect Conditions in the United States - 1968
  Forage Legumes (pp. 153-161).
  Soybeans (pp. 161-163).
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  Tobacco (pp. 167-168).

Spread of Alfalfa Weevil, 1904-1968 (p. 154).

Distribution of Alfalfa Weevil (p. 156).

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WEATHER BUREAU'S 30-DAY OUTLOOK

MARCH 1969

The Weather Bureau's 30-day outlook for March 1969 is for temperatures to average below seasonal normals over the southeastern third of the Nation, as well as over the northern Rockies and California. Above normal temperatures are expected over the northern Mississippi Valley, the upper Lakes region, and northern New England. Near normal temperatures are in prospect elsewhere. Precipitation is expected to exceed normal over the Southeast, most of California and the Great Basin, and portions of the northern Plains. Subnormal totals are in prospect over the northern Mississippi Valley and Great Lakes, as well as the western part of the southern Plains. Near normal totals are indicated in unspecified areas.

Weather forecast given here is based on the official 30-day "Resume and Outlook" published twice a month by the Weather Bureau. You can subscribe through the Superintendent of Documents, Washington, D.C. 20250. Price $5.00 a year.

Weather continued on page 168.

SPECIAL INSECTS OF REGIONAL SIGNIFICANCE

ARMY CUTWORM (Chorizagrotis auxiliaris) - KANSAS - None found in wheat in McPherson Reno, Kingman, and Harvey Counties. No activity of this or Agrotis orthogonia (pale western cutworm) reported from western area. (DePew). OKLAHOMA - Destroying young alfalfa in Canton area, Blaine County. Counts up to 7 per 10 linear feet continue in wheat in favorable areas of Payne County. (Okla. Coop. Sur.).

GREENBUG (Schizaphis graminum) - TENNESSEE - Light, averaged 5 per 100 sweeps, in Chester County wheat. (Turpen). ARKANSAS - Populations low, but higher than any time this winter in northwest area. Ranged 10-15 per 100 sweeps in oats in Washington County. (Boyer). KANSAS - None found in wheat in McPherson, Reno, Kingman, and Harvey Counties. No activity from western area. (DePew). OKLAHOMA - Ranged 0-14 per linear foot in wheat in Kiowa County. In Jackson County, remains up to 100 per linear foot. (Okla. Coop. Sur.). TEXAS - Activity about same level as previous week in northern panhandle area. Very heavy in scattered areas in counties south and east of Amarillo. In Rolling Plains area small grains growing, damage declining. Decline accredited to increased growth of small grain. (Almand, Daniels, et al.). NEW MEXICO - Ranged 5-25 per linear row foot in barley in Chaves County; averaged 100+ per linear row foot in 2 fields. (Mathews, Feb. 21).

SPOTTED ALFALFA APHID (Therioaphis maculata) - ARIZONA - Generally light in alfalfa in Salt River Valley, Maricopa County. One field at Yuma required treatment. (Ariz. Coop. Sur.). NEW MEXICO - This species and Acyrthosiphon pisum (pea aphid) increasing in Chaves County alfalfa. T. maculata averaged 10-65 per square foot previous week. (Mathews).

CORN, SORGHUM, SUGARCANE

SOUTHWESTERN CORN BORER (Diatraea grandiosella) - MISSOURI - Larval counts from cornstalks in 2 fields in New Madrid County: 75 live, 77 dead in first field; 45 live, 24 dead in second field. None found in 363 girdled stalks from 6 fields in southwest area. (Munson).

SMALL GRAINS

ENGLISH GRAIN APHID (Macrosiphum avenae) - ARKANSAS - Increasing in oats in Washington County; ranged 40-50 per sweep. (Boyer).

CORN LEAF APHID (Rhopalosiphum maidis) - ARIZONA - Averaged 12 per barley plant in most nontreated fields in Yuma, Yuma County. (Ariz. Coop. Sur.).

FORAGE LEGUMES

EGYPTIAN ALFALFA WEEVIL (Hypera brunneipennis) - ARIZONA - Ranged 50-250 larvae per 100 sweeps in alfalfa in Salt River Valley, Maricopa County. Treatments applied to some fields. Heavy in uncut hay on Yuma Mesa and averaged 120 per 100 sweeps in Gila Valley, Yuma County. (Ariz. Coop. Sur.).

PEA APHID (Acyrthosiphon pisum) - ARIZONA - Averaged 3,000 per 100 sweeps in alfalfa at Yuma, Yuma County. (Ariz. Coop. Sur.). NEW MEXICO - Ranged 5-25 per square foot in Chaves County alfalfa. Some control being undertaken. (Mathews, Feb. 21). ARKANSAS - No increase noted in northwest area. Ranged 2-5 per square foot in vetch. No growth in alfalfa to date. (Boyer).

LYGUS BUGS (Lygus spp.) - ARIZONA - Averaged 15 adults per 100 sweeps of alfalfa at Yuma, Yuma County. (Ariz. Coop. Sur.).

COLE CROPS

DIAMONDBACK MOTH (Plutella xylostella) - FLORIDA - Damage moderate in untreated cabbage in experimental plots at Sanford, Seminole County; infestation about 25 percent. No apparent damage in treated commercial fields. Determined by G.L. Greene. (Greene, Feb. 24).

CABBAGE LOOPER (Trichoplusia ni) - FLORIDA - Extremely low on cabbage in Sanford area, Seminole County; 1 larva on 200 plants in unsprayed experimental plots. No apparent damage in commercial plantings. Determined by G.L. Greene. (Greene, Feb. 24).

CABBAGE APHID (Brevicoryne brassicae) - FLORIDA - Damage moderate to untreated cabbage in experimental plots at Sanford, Seminole County; about 25 percent infested. No apparent damage to commercial cabbage, except in one field. Determined by G.L. Greene. (Greene, Feb. 24).

GENERAL VEGETABLES

A SPOTTED CUCUMBER BEETLE (Diabrotica undecimpunctata tenella) - NEW MEXICO - Caused spotted damage on seedling lettuce plants in Dona Ana County. Some fields treated. (Campbell).

DECIDUOUS FRUITS AND NUTS

PEACH TREE BORER (Sanninoidea exitiosa) - TEXAS - Detected in Tarrant and Parker Counties. One of most damaging pests of peach in eastern part of State. (Turney, Boring).

BROWN STINK BUG (Euschistus servus) - ARIZONA - Adults appearing on deciduous fruit trees in Salt River Valley, Maricopa County. (Ariz. Coop. Sur.).

PEAR PSYLLA (Psylla pyricola) - OREGON - Overwintering adults first noted in Hood River Valley, Hood River County, February 22. No oviposition to date; eggs from dissected females undeveloped. (Zwick).

CITRUS

CALIFORNIA RED SCALE (Aonidiella aurantii) - CALIFORNIA - Medium on orange trees in Bakersfield, Kern County. (Black).

CITRUS RED MITE (Panonychus citri) - ARIZONA - Treatments to begin in groves at Yuma, Yuma County. (Ariz. Coop. Sur.).

SMALL FRUITS

SAN JOSE SCALE (Aspidiotus perniciosus) - CALIFORNIA - Heavy on 10 acres of grapevines in Empire, Stanislaus County. (Cal. Coop. Rpt.).

ORNAMENTALS

AN ARMORED SCALE (Parlatoria proteus) - FLORIDA - All stages localized on 1 of 5 viburnum plants at nursery in Mt. Dora, Lake County. Collected by W.P. Henderson, February 6, 1969. This is a new Florida Department of Plant Industry host record. (Fla. Coop. Sur.).

PINEAPPLE SCALE (Diaspis bromeliae) - CALIFORNIA - Medium on pineapple plants in a nursery in Kenwood, Sonoma County. (Cal. Coop. Rpt.).

GRAPE SCALE (Diaspidiotus uvae) - VIRGINIA - This species and Chionaspis parkii (an armored scale) infested about 10-15 percent of sycamore trees in nursery at Portsmouth, Norfolk County. (Pierce, Weidhaas, Feb. 14).

FOREST AND SHADE TREES

SOUTHERN PINE BEETLE (Dendroctonus frontalis) - ARKANSAS - Detection flights made in Ashley County, February 24, 1969. Sixteen spots of dead timber observed. First record of this species in State since 1913. (Warren).

CALIFORNIA OAKWORM (Phryganidia californica) - CALIFORNIA - Larvae medium on oak nursery stock in Salinas, Monterey County. (Cal. Coop. Rpt.).

AN APHID (Cinara pilicornis) - MARYLAND - Found on hemlock near Glen Burnie, Anne Arundel County, May 22, 1968. This is a new State record. Heavy on spruce at a home in Baltimore, Baltimore County, May 23, 1968. This is a new county record. Both collections by C.W. McComb. Determinations by J.P. Pepper. (U. Md., Ent. Dept.).

MAN AND ANIMALS

SCREW-WORM (Cochliomyia hominivorax) - Four cases reported in U.S. February 23-March 1 as follows: TEXAS - Bee 3, Maverick 1. Total of 72 cases reported in portion of Barrier Zone in Republic of Mexico February 17-22, as follows: Territorio sur de Baja California 13, Sonora 23, Chihuahua 2, Coahuila 1, Nuevo Leon 7, Tamaulipas 26. Total of 6 cases reported in Mexico south of Barrier Zone. Barrier Zone is area where eradication operation underway to prevent establishment of self-sustaining population in U.S. Sterile screw-worm flies released: Texas 22,668,000; Mexico 56,360,000. (Anim. Health Div.).

COMMON CATTLE GRUB (Hypoderma lineatum) - OKLAHOMA - Ranged 0-8 per head (averaged 1.5) on cattle in Payne County. (Okla. Coop. Sur.).

A NOSE BOT FLY (Cephenemyia jellisoni) - OKLAHOMA - Adult noted on deer in Cherokee County. (Okla. Coop. Sur.).

A CUTEREBRID FLY (Cuterebra sp.) - GEORGIA - Larva removed from man's leg at Carnesville, Franklin County, August 22, 1968. Collected by R. Sullivan. Determined by C.W. Sabrosky. (Coleman, Feb. 29).

SHEEP KED (Melophagus ovinus) - TEXAS - Heavy on sheep in many Trans-Pecos area counties. (Neeb).

LONE STAR TICK (Amblyomma americanum) - OKLAHOMA - Light on cattle in Choctaw and Sequoyah Counties and on dogs in Cherokee County. About 100 on a red fox in Mayes County. (Okla. Coop. Sur.).

EAR TICK (Otobius megnini) - OKLAHOMA - Infested 750-1,000 cattle on 6 farms in Vian area, Sequoyah County. Ranged 10-45 per ear on 4 yearlings. (Okla. Coop. Sur.).

STORED PRODUCTS

CONFUSED FLOUR BEETLE (Tribolium confusum) - IOWA - Infested bulk ground feed at Bancroft, Kossuth County. (Iowa Ins. Sur.).

A TINEID MOTH (Paraneura simulella) - CALIFORNIA - Larvae in alfalfa seed at Brawley, Imperial County. (Cal. Coop. Rpt., Feb. 21).

BENEFICIAL INSECTS

BIG-EYED BUGS (Geocoris spp.) - ARIZONA - Averaged 10 per 100 sweeps of alfalfa in Salt River Valley, Maricopa County. (Ariz. Coop. Sur.).

FEDERAL AND STATE PLANT PROTECTION PROGRAMS

CITRUS BLACKFLY (Aleurocanthus woglumi) - MEXICO - Biological Control Zone - Inspections made of 54,971 trees on 862 acres in municipios Villagran, Mainero, Padilla, Hidalgo, and Victoria, Tamaulipas; 1,169 trees on 162 acres found infested in municipios Villagran, Mainero, and Hidalgo. Chemical Control Zone - Inspections made of 47,449 trees on 747 acres in 9 municipios in State of Nuevo Leon and 1,846 trees on 29 acres in 5 municipios in Tamaulipas. Total of 203 trees on 122 acres found infested in municipios Linares, Hualahuises, Montemorelos, and Monterrey, Nuevo Leon. Infestations found in Matamoros, Tamaulipas, for first time since 1966 and included 15 properties and 18 trees on approximately one acre. Delimiting survey still underway in Matamoros. Inspections made of 453 trees on 207 properties in 3 municipios in Baja California and 2,811 trees on 522 properties in Sonora with negative results. (PPC Mex. Reg., Jan. Rpt.).

IMPORTED FIRE ANT (Solenopsis saevissima richteri) - ALABAMA - All mounds inspected in Lee County extremely active with numerous winged forms near top of mounds. (Leeper et al.). TENNESSEE - Surveys negative in Warren, Giles, Lawrence, and Lincoln Counties. (Green, Watson).

MEDITERRANEAN FRUIT FLY (Ceratitis capitata) - MEXICO - Total of 3,132 traps operated during January. No C. capitata taken. (PPC Mex. Reg.).

MEXICAN FRUIT FLY (Anastrepha ludens) - MEXICO - In Tijuana, 350 traps inspected 1,007 times; 5 marked flies recaptured. Total of 28 native flies (13 males, 15 females) trapped in Tijuana during 1968. Sixty traps in Tecate, Baja California, inspected 180 times with negative results. No native flies trapped during 1968. In Ensenada, Baja California, 150 traps inspected 576 times with negative results. Only one native fly (male) trapped in Ensenada during 1968. (PPC Mex. Reg., Jan. Rpt.).

WHITE-FRINGED BEETLES (Graphognathus spp.) - TENNESSEE - None found in Giles County. (Watson).

WOOLLY WHITEFLY (Aleurothrixus floccosus) - MEXICO - Seven infestations found in municipio Ensenada, Baja California, during January. (PPC Mex. Reg.).

WINTER MOTH SURVEY IN MAINE

During late fall 1968, an intensive survey for winter moth (*Operophtera brumata*) was conducted throughout the coastal areas of Maine from Bar Harbor to Calais. Results of the survey were negative for winter moth. Much of the material collected consisted of males and females of fall cankerworm (*Alsophila pometaria*) and Bruce spanworm (*Operophtera bruceata*). Blacklight traps attracted the greatest number of male moths; however, a new stocking-type (vapona) trap was effective in capturing wingless females. Although the survey was negative for winter moth, indications are that the stocking-type trap provides, for the first time, a tool for volume trapping over extensive areas.

Material collected during the survey was determined by A.E. Brower and included the following species: *Agrotis ipsilon* (black cutworm), *Alsophila pometaria* (fall cankerworm), *Lithophane fagina*, *Lithophane* spp., *Operophtera bruceata* (Bruce spanworm), *Peridroma saucia* (variegated cutworm), *Plathypena scabra* (green cloverworm), and *Pseudaletia unipuncta* (armyworm). (PPC East. Reg.).

INSECT DETECTION

New State Records

A EULOPHID WASP (*Bestiola mira* Nikol'skaya) - HAWAII - Reared from an armored scale (*Odonaspis greeni*) infesting small bamboo plant in Honolulu, Oahu, in January 1969. Determined by C. Yoshimoto. This is first record for Western Hemisphere. *B. mira* is not known to occur in the continental United States. (p. 152).

AN APHID (*Cinara pilicornis*) - MARYLAND - Collected from hemlock near Glen Burnie, Anne Arundel County, May 22, 1968. (p. 149).

New County Records

AN APHID (*Cinara pilicornis*) - MARYLAND - Baltimore County. (p. 149).

ALFALFA WEEVIL (*Hypera postica*) - WASHINGTON - Clallam County. (p. 153).

CORRECTIONS

CEIR 19(9):126 - PEAR PSYLLA (Psylla pyricola) - OREGON - Lines 3 and 4 should read ..., adults up to 5 per *tap*, mostly 1-2 per *tap*...

LIGHT TRAP COLLECTIONS

FLORIDA - Gainesville - 2/22-25, BL - Black cutworm (*Agrotis ipsilon*) 3, granulate cutworm (*Feltia subterranea*) 5, yellow-striped armyworm (*Prodenia ornithogalli*) 1.

HAWAII INSECT REPORT

New State Record - Specimens of a EULOPHID WASP (*Bestiola mira* Nikol'skaya) reared from an armored scale (*Odonaspis greeni*) infesting small bamboo plant in Honolulu, Oahu, in January 1969. Determined by C. Yoshimoto. This species is known to occur in Japan and USSR. (Beardsley). This is the first record of *B. mira* for the Western Hemisphere, but the species is not known to occur in the continental United States. (PPC).

General Vegetables - TROPICAL GARDEN SYMPHYLID (*Hanseniella unguiculata*) heavy on roots of young zucchini squash and causing severe stunting of plants in Hilo, Hawaii. (Yoshioka).

Fruits and Nuts - COCONUT SCALE (*Aspidiotus destructor*) light to medium on several coconut trees in Kaaawa and Pupukea, Oahu. Not known to infest coconut trees in southwestern, western, eastern, and northeastern coastal areas of island. Not known to occur in central Oahu, Honolulu proper, or on neighboring islands. Light scattered infestations found for first time on several papaya trees adjacent to previously heavily infested banana trees at Pearl City. Most heavily infested banana foliage removed. (Funasaki, Bianchi). Recurring medium to heavy larval infestations of a NOCTUID MOTH (*Phlegetonia delatrix*) heavily damaging terminal leaves of backyard mountain-apple at Kaneohe and Pauoa, Oahu. On Hawaii, severely damaging terminal leaves of young ohia-lehua trees (*Metrosideros collina polymorpha*) in several areas. This is new host record. Damage heavy on mountain-apple and Java-plum foliage in Hilo. (Funasaki, Yoshioka).

Ornamentals, Forest, and Shade Trees - A BARK BEETLE (*Xylosandrus compactus*) caused much damage to forest planting of cedar (*Toona ciliata*) at Waiakea, Hawaii. (Davis). Eggs and adults of a PLATASPID BUG (*Coptosoma xanthogramma*) heavy and confined to terminals of 7 sesban trees in Kaneohe, Oahu. Adults ranged 30-100 on terminals compared with 5-10 several months ago. All stages heavy on jade vine flowers in scattered areas on Oahu. Heavy populations reported on pigeon-pea in several areas. Population of a scelionid wasp (*Trissolcus* sp.), an egg parasite, at low level; only one percent of *C. xanthogramma* eggs parasitized. (Funasaki, Bianchi, Au).

Beneficial Insects - LANTANA CERAMBYCID (*Plagiohammus spinipennis*) and LANTANA LEAF BEETLE (*Octotoma scabripennis*) heavy on lantana on Puu Lehua, Central Kona District, Hawaii, at 3,000 feet elevation. This is new locality record for both species and represents large spread from release point. (Davis).

Miscellaneous Insects - An adult of a LONGHORN GRASSHOPPER (*Euconocephalus nasutus*), the third specimen to date, found in yard at Aiea, Oahu, on February 26. First discovered in vacant lot at Waipahu in January 1968; second specimen found in yard in Kaimuki area of Honolulu in November 1968. (Au). One adult of another GRASSHOPPER (*Oedaleus abruptus*) found in grass at borderline between Fort Kamehameha and Hickam Air Force Base, Oahu. Rains and high winds hampering spray operations in known infested areas at Hickam. (Olson).

SUMMARY OF INSECT CONDITIONS IN THE UNITED STATES - 1968

(Continued from page 144)

FORAGE LEGUMES

Highlights:

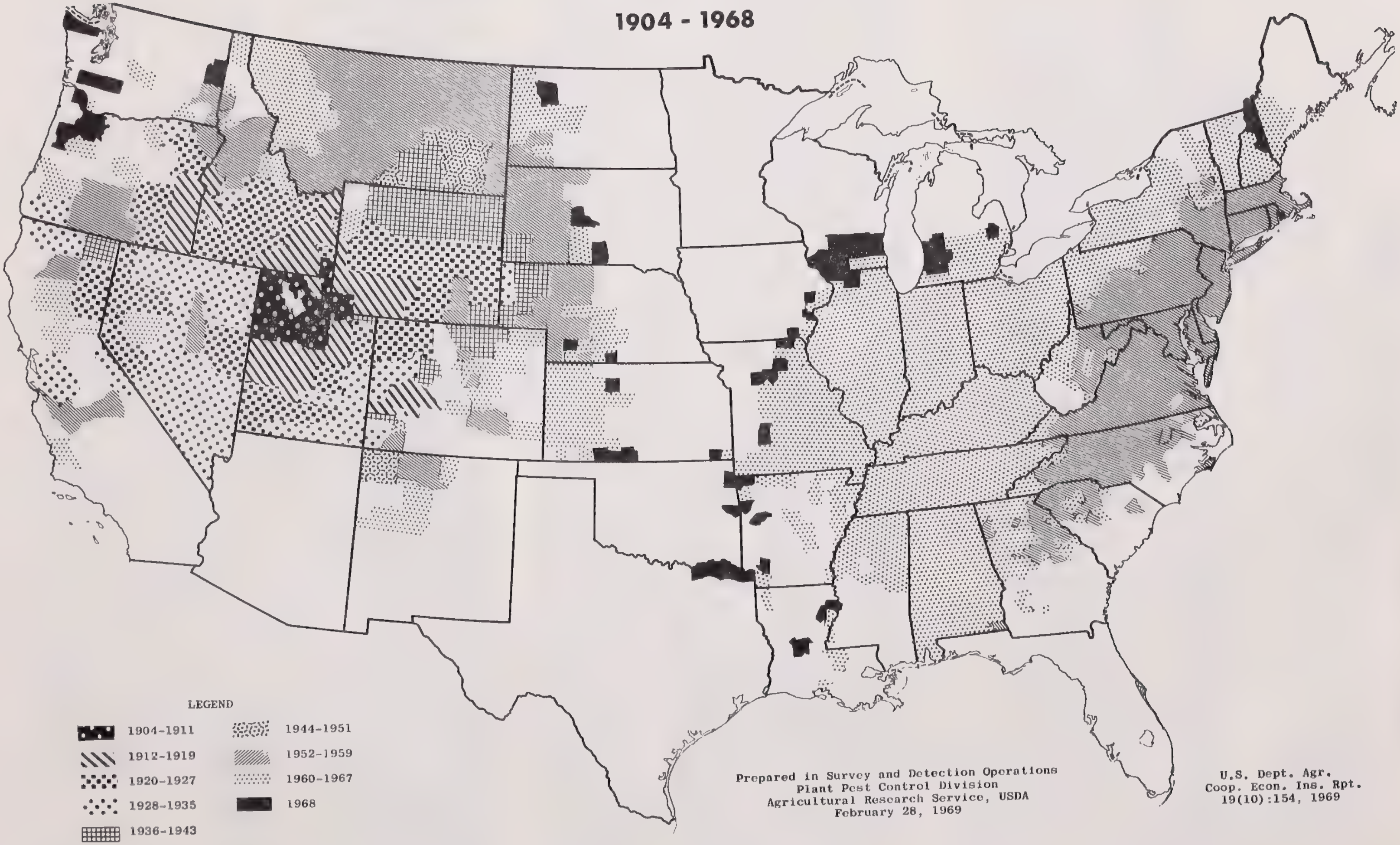
ALFALFA WEEVIL continued to be the most important pest of alfalfa in the Nation. It was reported for the first time in Texas and Oklahoma. Damage to alfalfa ranged light to heavy in many areas but was lighter than in 1967 in some sections. CLOVER HEAD WEEVIL was a serious pest of crimson clover seed production in Alabama. PEA APHID required controls in several areas. Populations on alfalfa were heavy in Arizona early in the year, damaging in Nebraska in mid-May, and severe in Kansas in April and May. Parasites and predators were effective in some areas. MEADOW SPITTLEBUG was more abundant in Illinois, Indiana, and Ohio than in recent years. LYGUS BUGS were of some concern on alfalfa in several Western States. THREE-CORNERED ALFALFA HOPPER was unusually abundant on alfalfa in the Virden Valley of New Mexico. VARIEGATED CUTWORM damaged alfalfa in scattered areas.

The ALFALFA WEEVIL (*Hypera postica*) infestation near Ellensburg in Kittitas County, WASHINGTON, increased from one square mile in 1967 to 32 square miles this year. Damage ranged light to moderate. In Clark County larvae ranged 2-10 per sweep in 7 representative alfalfa fields. Lewis and Spokane Counties were reported as new records; Clallam County is a new county record. Adults were found in Linn County, OREGON, in late February. New larvae were found May 24 in Klamath County. Larvae ranged 85-110 per sweep in untreated plots in Crook and Klamath Counties in late June and early July. Leaf loss averaged up to 63 percent. Numbers were lower in other areas. Alfalfa weevil continued to spread in the Willamette Valley. It was reported in 6 new counties. Counts were low, the highest average being 2.4 larvae per sweep in one Clackamas County field. Alfalfa weevil was much reduced in most CALIFORNIA areas. Damage in NEVADA was heavy for the third straight year. As in 1966 and 1967, weather retarded alfalfa growth and staggered hatch and larval development. In contrast to 1967, explosive populations developed with the return of favorable weather. Larval populations and damage peaked near mid to late June. Heavy adult damage to new growth of the second crop occurred for the second consecutive year, but was restricted to Lyon County.

Alfalfa weevil adults were active and mating during the first week of March at Aberdeen in Bingham County, IDAHO. Fully developed eggs were observed at Marsing, Owyhee County, the last of April. Larval damage was evident on 50-100 percent of alfalfa terminals by May 25 in Owyhee County and by June 15 in the Magic Valley area. Larvae averaged 24 per sweep by mid-June in experimental plots at Aberdeen. Pupation occurred about the time of first-crop cutting. Weevils were light in northern Idaho. In MONTANA alfalfa weevil was less destructive than in the previous 2 years, but damage was still extensive. Alfalfa weevil was the most damaging crop pest in WYOMING. Adults were first found in Washakie County on April 10. On May 20, larvae were first noted in Hot Springs County. In mid-June the population peaked in the Big Horn Basin. For the rest of the season a few larvae were present. Most damage was in the northern area and the Big Horn Basin. Damage in UTAH evolved later than usual in the spring. Damage in 1968 was greater than in 1967. The most severe outbreak experienced since the advent of modern insecticides occurred at Hurricane, Washington County, and in alfalfa seed areas of Millard County. In northeastern COLORADO alfalfa weevil ranged moderate to heavy. Larvae were light to moderate in the Arkansas Valley and on the Western Slope. Loss and quality reduction of alfalfa were light to moderate throughout most of the State, but ranged moderate to heavy in Logan and Morgan Counties. In NEW MEXICO alfalfa weevil was heavy and damaged the first and second cuttings of alfalfa in Bernalillo, San Juan, Rio Arriba, and Santa Fe Counties.

Spread of Alfalfa Weevil in the United States

1904 - 1968



Prepared in Survey and Detection Operations
Plant Pest Control Division
Agricultural Research Service, USDA
February 28, 1969

U.S. Dept. Agr.
Coop. Econ. Ins. Rpt.
19(10):154, 1969

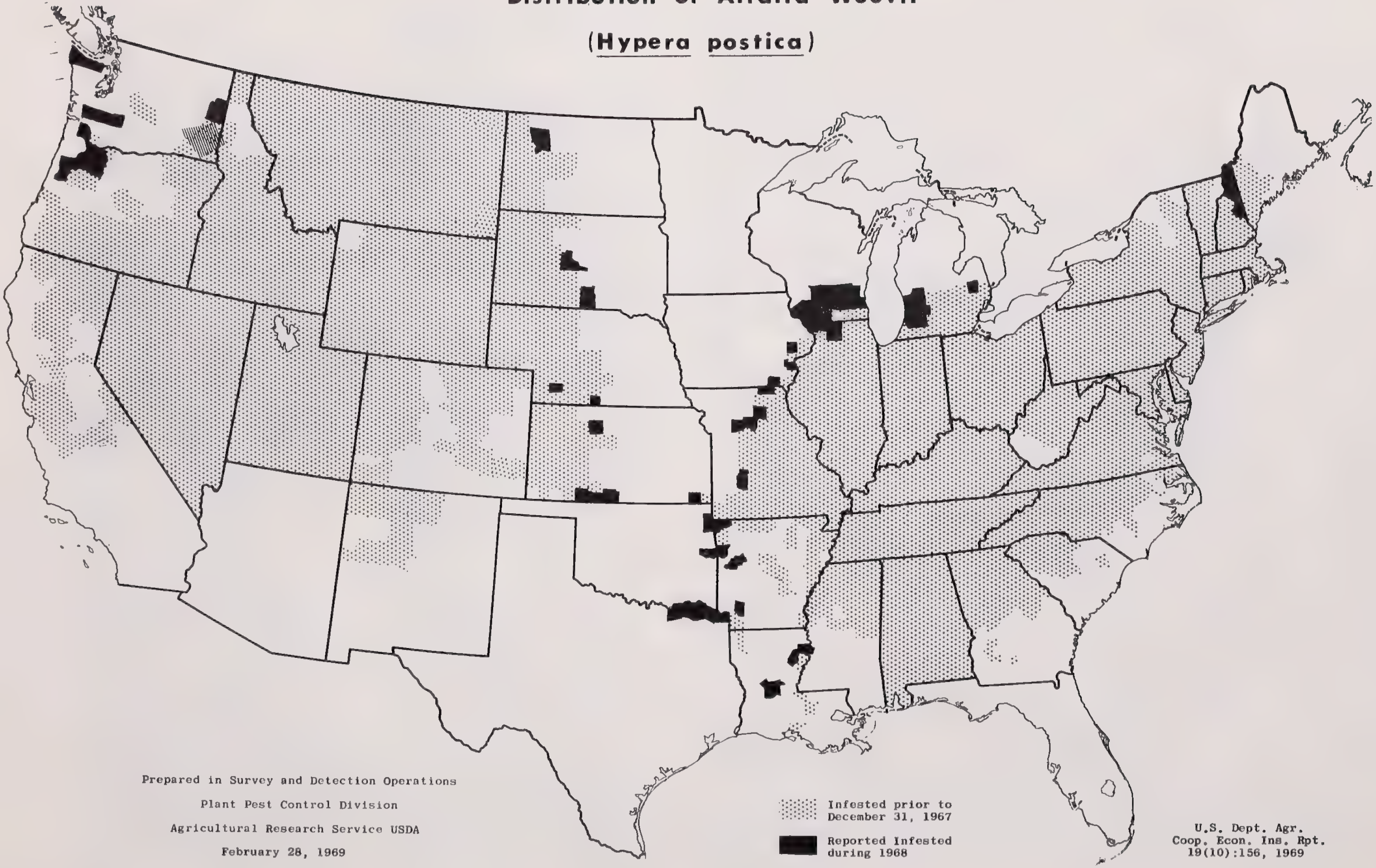
Alfalfa weevil was detected for the first time in TEXAS in Bowie, Red River, Lamar, and Fannin Counties during May and June. Larvae were collected in Delaware and Sequoyah Counties, OKLAHOMA, in May for a new State record. In most areas of KANSAS populations were extremely light. Two fields in Finney County were treated. No weevils were found in alfalfa fields in which they had been collected in 1967 in Cherokee County. New county records were reported in Barber, Clark, Comanche, Rooks, and Labette Counties for a total of 36 infested counties in Kansas in 1968. Alfalfa weevil was first noted on May 8 in Dawson County, NEBRASKA, when 3 adults and 3 larvae were taken in 2,000 sweeps. This pest was first observed in the panhandle area on May 22. By mid-June larval numbers peaked in Dawson County and were last detected October 4. Harlan and Hayes Counties were reported as new county records. In the northern Black Hills of SOUTH DAKOTA the first alfalfa weevil adults were taken March 21 to April 22 on stickyboard traps around alfalfa fields near Spearfish, Lawrence County. By May 31, adults ranged 8-64 per 100 sweeps and egg laying had begun. Larval populations of 12 per 100 sweeps infested 3 to 8-inch alfalfa. A week later, adults had increased to 122 per 100 sweeps. In mid-June when damage was evident in many fields in southern Butte, Lawrence, and Meade Counties, and the first cutting of alfalfa was beginning, larvae ranged up to 2,200 per 100 sweeps and adults had decreased to 40 per 100 sweeps. Populations peaked the last of June with over 6,000 larvae per 100 sweeps but soon decreased. Adults, one per 100 sweeps, remained on alfalfa near Spearfish as late as the first of October. Economic populations and damage were confined to the immediate vicinity of the northern Black Hills of South Dakota. Larval populations were high in the infestation area, but alfalfa was cut before much damage occurred. Chemical controls were applied to some fields. Larval collections in mid-July established Stanley and Tripp Counties as new county records. Alfalfa weevil adults were active on alfalfa by April 19 in NORTH DAKOTA and larvae were heavy by June 17. Larvae ranged up to 5,640 (averaged 1,077) per 100 plants and adults up to 150 (averaged 40) per 100 sweeps. Percent of tips infested ranged up to 100 (average 64) percent. Foliar damage ranged up to 5 (average 1) percent on irrigated alfalfa in McKenzie County. Controls were applied where the first crop was used for seed production. Larvae were collected for the first time in Mountrail County, bringing the total to 15 infested counties.

Alfalfa weevil caused light damage to alfalfa in IOWA and was found in 3 new counties. Larvae were first active in southeastern MISSOURI during mid-March. Damage was heavy in untreated fields in the southern and eastern areas. This weevil was reported for the first time in 7 new counties of Missouri and is now known to occur in 81 counties in the State. This was the most serious alfalfa pest in Missouri in 1968. Alfalfa weevil was reported for the first time from Benton, Crawford, Hempstead, and Logan Counties, ARKANSAS, in 1968 and now occurs in every alfalfa-growing area in the State. Treatment is universal in the northeastern and southwestern areas while infestations remain low in the northwestern area. Alfalfa weevil was heavy on the declining alfalfa acreage in ALABAMA. Damage occurred on white clover, vetches, and other legumes. Larvae ranged from 3-40 per sweep in western TENNESSEE to 10-30 per sweep in the eastern area. Counts were locally higher in western fields in April. Cool weather delayed pupation in eastern area fields.

Alfalfa weevil larvae and adults were collected by May 24 in Kenosha, Racine, and Walworth Counties, WISCONSIN. By June 7, larvae were nearly full grown and ranged up to 15 per 50 sweeps in Kenosha County. Pupation was underway by June 12 and damage to second-crop alfalfa was light. Adults were emerging in Kenosha County by July 5. Bathyplectes sp. (an ichneumon wasp) was found in Kenosha County on June 19. Alfalfa weevil adults were collected throughout the summer, indicating that a true summer dormancy does not exist in the State. This weevil was collected for the first time in 12 counties in Wisconsin. Alfalfa weevil increased and spread in the southern half of MICHIGAN and is now present in 28 counties. About 6,000 acres were treated in Monroe and other southernmost counties. It was found in 7 new counties. This weevil is expected to be more of a problem in the State in 1969 than in 1968.

Distribution of Alfalfa Weevil

(*Hypera postica*)



▨ Infested prior to December 31, 1967
■ Reported Infested during 1968

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Plant Pest Control Division
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Alfalfa weevil was collected for the first time in Jo Daviess, Stephenson, Winnebago, and Ogle Counties, ILLINOIS, in 1968 and now occurs Statewide. The weevil spread through the State in only 4 years. Economic infestations occurred in the southern third and portions of the south-central section of the State. This weevil was less troublesome than expected in 1968, probably due to a cool March and April, the advanced height of the alfalfa, and late hatch. During the week of May 13, larvae averaged 3,666 per 100 sweeps in the southeast district, 3,800 in the southwest district, 937 in the east-southeast, and 1,500 in the west-southwest. Tip feeding was 100 percent in nearly every alfalfa field in the southern third of Illinois in May and 80 percent in the south-central section. Parasitism by Bathyplectes curculionis (an ichneumon wasp) averaged 46.6 percent in the east-southeast area in May. Occasional fields were sprayed as far north as Effingham. Alfalfa weevil development was 2-3 weeks behind 1967 in southern INDIANA due to cool, wet conditions. Populations were economic in southern areas in late April when larvae ranged up to 9 per stem on 40-100 percent of the alfalfa. Larvae were heaviest in the south-central and southeast districts about mid-May. Adult emergence peaked about June 1 in southern Indiana. Larvae ranged 1-5 per stem during the week of May 24 in central districts with 30-100 percent light to moderate feeding. Larvae ranged 0.5-3 per stem in northern districts in late May and early June. Damaging numbers were restricted to the southern counties of the north-central and northeast districts plus the extreme northeast corner of Indiana. Bathyplectes curculionis (an ichneumon wasp) was found in many areas and was heavy in southwestern Indiana. First egg hatch in southern OHIO occurred the first week of April. Larval feeding began in some northeastern counties the third week of April. During the last half of April larval populations began to increase, and damaging numbers were present by end of May. Control operations began in southern Ohio the third week of April and about mid-May farther north. Larval damage was variable and unpredictable. Populations varied from field to field. An apparent delay of major oviposition from the fall of 1967 until spring of 1968 may have delayed major damage in the southern counties through much of May. During May cool, wet weather affected larval abundance and spray programs. However, by the time first cutting had begun in late May and early June, most damage to the first growth had occurred. By mid-June most unsprayed alfalfa was lost or heavily damaged. Generally, larvae were damaging in any unsprayed field. Populations ranged up to 160 per sweep in late May and early June. By mid-June, stubble treatment to protect the second growth was of primary concern. Damaging larval populations persisted in some central and northern fields through late June.

Alfalfa weevil was the most important insect on alfalfa in VIRGINIA although infestation levels were lower than in 1967. Larvae were detected as early as March 21. Larvae were lighter in 1968 than in previous years in MARYLAND. Alfalfa which was sprayed too early or not sprayed at all was seriously damaged. First adults were found March 15. By early April larval increases were significant on the Eastern Shore and by mid-April in the central section. Larval populations failed to peak. Larvae continued light to heavy through May. By early June new adults were active. Fall surveys showed fewer overwintering adults than in previous years. This may indicate lower larval populations again in 1969. Larvae caused less damage to first-growth alfalfa in 1968 than in previous years in DELAWARE. Most fields had only moderate injury. Controls were not needed in many fields. Injury to second-growth alfalfa was light in most areas.

Alfalfa weevil populations on forage in PENNSYLVANIA were reduced for the third consecutive year. Cold, wet weather in May delayed larval activity enough to permit harvesting without much damage. Over half of the acreage harvested had not been treated. Larval activity was evident in September but very light compared with the fall of 1967. Adults were first active and laying eggs May 23 in RHODE ISLAND. Infestations were heavy in some fields by June 27. Alfalfa weevil was collected in Carroll and Coos Counties, NEW HAMPSHIRE, and is now statewide in distribution. Tip damage first occurred May 16 at Kingston, Rockingham County, and ranged 10-90 percent in the southern area. The first pupa was seen on June 13. By June 26 the population passed the peak in the southern area. Alfalfa weevil now occurs throughout VERMONT. Larval feeding caused 20-25 percent loss to untreated alfalfa. A wet spring and lush growth minimized losses in most areas.

EGYPTIAN ALFALFA WEEVIL (Hypera brunneipennis) infestations were much reduced in most areas of CALIFORNIA. Larvae damaged alfalfa terminals in many fields in Maricopa, Pinal, and Yuma Counties, ARIZONA, during February through April. Damage ranged 5-100 percent. Treatments were required in many fields, especially in Yuma County.

CLOVER LEAF WEEVIL (Hypera punctata) larvae damaged alfalfa in several scattered localities of UTAH. A specimen collected in an alfalfa field near Roswell, Chaves County, NEW MEXICO, was reported as a new county record. Clover leaf weevil caused light damage in scattered ares of OKLAHOMA from early March to early June. This weevil caused light damage to alfalfa in southeastern KANSAS in the spring. In other areas populations were light with little damage. Clover leaf weevil was low in ILLINOIS compared with 1967. A high of 20 per square foot occurred in the western and west-southwestern districts the week of April 22. Populations were controlled by a fungus the last of April. Larvae ranged 1-5 per square foot on alfalfa and clover in southern INDIANA in early April. Trace numbers were present in other areas. Populations were below 1967 levels. Clover leaf weevil caused light to moderate damage in scattered fields of red clover in VIRGINIA. CLOVER HEAD WEEVIL (Hypera meles) was again a serious pest of crimson clover seed production in ALABAMA. This weevil infested crimson clover in Rusk, Bowie, and Red River Counties, TEXAS, during April and May.

PEA LEAF WEEVIL (Sitona lineatus) was reported for the first time in Klamath County, OREGON, for the first record east of the Cascades in the State. In Yamhill County, this weevil defoliated large areas in a field of vetch and then moved into alfalfa. CLOVER ROOT CURCULIO (Sitona hispidulus) was light on alfalfa in north-central KANSAS in May and caused little damage. CLOVER SEED WEEVIL (Miccotrogus picirostris) adults averaged 12 per sweep on seed white clover in Boundary County, IDAHO, on June 18.

CLOVER ROOT BORER (Hylastinus obscurus) was reported for the first time in Franklin County, WASHINGTON, where it caused heavy damage to a stand of alfalfa. This pest was mostly noneconomic in northwestern ARKANSAS. VETCH BRUCHID (Bruchus brachialis) destroyed several tons of vetch seed at Bellingham, Whatcom County, WASHINGTON, in October. This was the first reported infestation from this area, where vetch pods have been under observation for a number of years. BLACK BLISTER BEETLE (Epicauta pennsylvanica) adults caused economic damage to alfalfa in Beadle and Lake Counties, SOUTH DAKOTA, the first of August. Chemical control was undertaken.

PEA APHID (Acyrthosiphon pisum) was below economic levels over most of OREGON. Counts averaged 25-50 per sweep. A severe outbreak near Hermiston, Umatilla County, was controlled by parasites in 2 weeks. Pea aphid occurred in local areas of CALIFORNIA all year. This aphid required controls on alfalfa from March to August in Nye, Humboldt, Lyon, and Pershing Counties, NEVADA. This aphid averaged less than 1 per sweep on alfalfa May 1 in Canyon and Owyhee Counties, IDAHO, but averaged 100 per sweep to 0.5 cup per sweep by mid to late June in several southern areas. Natural enemies were abundant by this time. In UTAH several thousand acres of alfalfa were sprayed although pea aphid was below normal. Pea aphid appeared on alfalfa in Fremont County, WYOMING, May 6. Populations increased until early July and then declined. Scattered outbreaks throughout the State developed moderate to heavy numbers. Some controls were applied in Washakie County where regrowth of second-cutting alfalfa was damaged. Pea aphid ranged light to moderate on alfalfa in the Arkansas Valley of COLORADO. Pea aphid was heavy in ARIZONA from February through April in Yuma County, in April in Maricopa and Pinal Counties, and from September through October in Cochise County.

Pea aphid increased gradually in southeastern NEBRASKA in April. Damaging levels were reached in mid-May with up to 2,000 per 10 sweeps. Populations remained heavy until May 25-30 when natural enemies caused a decline. A severe pea aphid outbreak occurred on alfalfa in KANSAS from mid-April to mid-May. Infestations were heavy in about 30 central area counties, and damage was severe and general. Populations were not damaging in other areas of Kansas, except in a few local cases. Natural enemies played a major role in reducing populations. Pea aphid infested legumes in OKLAHOMA each month except in September. Counts were light to moderate except in spotty areas in late March, early April, and mid-July in Wagoner County. Pea aphid ranged light to heavy on alfalfa and Austrian Winter field peas in Foard and Hardeman Counties and vetch in Brazos County, TEXAS, in mid-April. Populations began increasing in early February in ARKANSAS. Counts reached 150-200 per 100 sweeps by mid-April with 20 percent winged forms. Populations declined in June.

Pea aphid was sporadic over MICHIGAN and presented no problems. Pea aphid eggs hatched about March 30 in WISCONSIN. Reproduction was well underway by May 3. Winged forms were evident May 10. Adults of Praon pequodorum (a braconid) and parasitized pea aphid nymphs were also common on the same date. Pea aphid alates were noted May 17. Heavy rains in early June and natural enemies caused a decline by June 14. Some fields required controls about midseason. Weather and natural enemies caused another decline in late June. About September 27, pea aphid increased with as many as 60 per sweep in a few fields. Egg laying was underway October 18. Pea aphid counts were very low in IOWA in May but increased in early June. However, infestations remained noneconomic throughout the season. Populations were unusually low on clover and alfalfa in ILLINOIS with a high of 100 per sweep in the southwestern district. Predators and diseases were also low. Pea aphid populations were at low levels in INDIANA during 1968. Highest counts of 80-200 per sweep occurred on first-growth alfalfa in the northern districts in mid-June. Pea aphid was of no significance on alfalfa in OHIO in 1968. Populations increased in late May, but numbers remained low during the summer.

Pea aphid caused little damage in VIRGINIA and was very light on alfalfa during spring in MARYLAND. Populations during late summer and early fall ranged moderate to heavy on the Eastern Shore of Maryland and some controls were necessary.

MEADOW SPITTLEBUG (Philaenus spumarius) was scattered over MICHIGAN, and no damage warranted much treatment. Nymphs were detected on alfalfa by May 3 in southern WISCONSIN. Eggs hatched in Lincoln County May 13. Most nymphs were in the second instar by May 17 and had wing pads on June 7. Adults appeared in southern counties June 12. Numbers varied considerably with the highest populations in southwestern counties and in some sandy locations. Adults were low, averaging 1.2 per sweep, for ILLINOIS during the fall survey. Numbers were higher than they had been for several years, but nymphs caused no economic damage in the spring. Spittle masses were common in most alfalfa and clover fields in IOWA. Counts ranged 0-5 masses per square foot of area with 2-3 nymphs per mass in early May. Adults were first collected in mid-June. Meadow spittlebug was heavier than for the past several years in mid-May in southern and central INDIANA. This pest was heaviest in the southeastern district where 60-90 percent of the plants had 1-4 spittle masses per stem with 2-14 nymphs per mass. In northern Indiana spittle masses ranged 1-3 per stem on 20-40 percent of the alfalfa and clover with 1-4 nymphs per spittle mass in late May. Meadow spittlebug eggs hatched about the third week of April in OHIO. Nymphs began to increase by May 1 and the first adults were collected June 4. By mid-June, adults averaged over 60 per sweep on red clover and alfalfa. Reports and observations indicated that spittlebugs were more abundant than usual in Ohio in 1968.

Meadow spittlebug nymphs ranged light to moderate on alfalfa in MARYLAND. Populations in red clover were the heaviest in several years, but very little acreage was sprayed for this pest alone. Meadow spittlebug caused moderate damage to red clover in the spring in VIRGINIA. Infestations of 30-100 percent of the stems were common. Damage was most severe in the central area. This pest was reported in 11 new counties of Virginia during the 1968 season.

LYGUS BUGS (Lygus spp.) were above normal on alfalfa in CALIFORNIA. Populations began increasing in late May, earlier than normal, in the alfalfa seed growing areas of NEVADA, especially in Humboldt and Lander Counties. Infestations were heavier than normal on prebloom alfalfa and continued heavy throughout the season. Lygus bugs were low in OREGON except in eastern Malheur County where counts ranged as high as 28 per sweep in alfalfa seed fields. Lygus bug populations exceeded 4 per sweep in many blooming alfalfa seed fields in Canyon County, IDAHO, on June 28. Counts in untreated seed alfalfa ranged up to 12 per sweep in Washington County August 2. These pests averaged less than 3 per sweep in treated fields. Lygus bugs were heavy on alfalfa in 11 counties in the eastern half of MONTANA and in 2 western counties of the State. These pests infested sainfoin in Carbon, Fergus, and Gallatin Counties. Lygus bug populations were low in WYOMING and remained noneconomic throughout the 1968 season. These pests built up during the spring on an unusual abundance of mustards in UTAH, and populations were generally above normal on alfalfa and other crops in the State. Lygus bugs occurred on alfalfa in cyclic patterns throughout the season in ARIZONA and were heavy from March to November. Populations remained at normal levels and caused little damage in KANSAS. Lygus distinctus infested legumes in TEXAS.

TARNISHED PLANT BUG (Lygus lineolaris) was unusually high on alfalfa statewide in DELAWARE during early July. Light numbers caused very little damage in VIRGINIA. Populations ranged light to moderate throughout IOWA all season, but damage was never evident. From mid-April to mid-November tarnished plant bug occasionally damaged alfalfa in OKLAHOMA. Tarnished plant bug was common on alfalfa throughout the season in INDIANA. Populations ranged 1-3 per sweep on first, second, and third-growth alfalfa 12 inches high or higher.

ALFALFA PLANT BUG (Adelphocoris lineolatus) was the most common insect on alfalfa in northern INDIANA during late July when counts reached 4-13 per sweep. Infestations were moderate in IOWA and no damage was recorded. Alfalfa plant bug remained at normal levels and caused little damage in KANSAS. Counts of alfalfa plant bug per 100 sweeps averaged 20 in Minnehaha and 200 in Lincoln Counties, SOUTH DAKOTA, in mid-June.

RAPID PLANT BUG (Adelphorcoris rapidus) was noneconomic in all areas of IOWA and remained at normal levels in KANSAS where little damage occurred.

THREE-CORNERED ALFALFA HOPPER (Spissistilus festinus) nymphs girdled alfalfa stems in scattered areas of Johnston and Bryan Counties, OKLAHOMA, during late August and September. Unusually heavy populations built up on alfalfa in the Virden Valley of NEW MEXICO in August. Adults ranged 35-85 per sweep in recently cut alfalfa. Lighter counts averaged 5-8 per sweep on alfalfa in the Hatch Valley. Three-cornered alfalfa hopper was light on alfalfa the entire year in ARIZONA. Moderate to heavy numbers were present from July to November in all counties. This pest ranged from normal to lighter than usual in UTAH, being heaviest in Washington County.

VARIEGATED CUTWORM (Peridroma saucia) damaged second-crop alfalfa in Lyon County, NEVADA, in July until controls were applied. This cutworm damaged alfalfa locally during the summer in UTAH. Injury was light on alfalfa in eastern NEBRASKA. Variegated cutworm reached economic levels in many fields in northeastern and east-central NEBRASKA in May and June. Almost all alfalfa fields examined in the eastern two-thirds of the State were infested. Larval populations in southeastern MISSOURI were high (up to 65 per square foot) on alfalfa. Counts were highest in mid-May. Controls were applied to most alfalfa in the southeastern delta area of Missouri. Variegated cutworm caused heavy damage to alfalfa in scattered fields across OKLAHOMA in May and early June. Infestations were heaviest, 30-100 per square yard, in the central and south-central areas. Variegated cutworm required controls in a few alfalfa fields in ARKANSAS. Populations ranged 4-5 per square foot in the northwestern area in late May. Variegated cutworm moths were taken in a blacklight trap at Madison, WISCONSIN, by April 25.

GREEN CLOVERWORM (*Plathypena scabra*) infested legumes in TEXAS and occasionally damaged alfalfa in OKLAHOMA. Green cloverworm reached economic levels in a few fields of alfalfa in east-central and northeastern KANSAS in July and August. Controls were applied. Green cloverworm ranged from 1 per 5 sweeps to 8 per sweep on alfalfa the first 3 weeks of August throughout INDIANA. This pest was more abundant in the State in 1968 than in the past 5 years.

YELLOW-STRIPED ARMYWORM (*Prodenia ornithogalli*) was moderate on alfalfa in Pinal County, ARIZONA, in late April and in Yuma County in May and June. Populations were heavy in early October in Maricopa County and from late October through November in Yuma County. Yellow-striped armyworm was lighter than normal and caused little damage in KANSAS. Populations in VIRGINIA were light. WESTERN YELLOW-STRIPED ARMYWORM (*P. praefica*) was lighter than normal in UTAH.

BEET ARMYWORM (*Spodoptera exigua*) damaged alfalfa in a few locations in CALIFORNIA. Infestations in ARIZONA ranged moderate to heavy in many alfalfa fields from April to November in Yuma County and from September through October in Graham, Maricopa, and Pinal Counties. Normally a minor pest in NEW MEXICO, beet armyworm damaged many seedling alfalfa fields in the Mesilla and Pecos Valleys in May and June. This pest also damaged mature stands of alfalfa and other agricultural crops throughout most of the State. Beet armyworm infested legumes in TEXAS.

ALFALFA CATERPILLAR (*Colias eurytheme*) was more prevalent in CALIFORNIA in 1968 than in 1967 and 1966. Populations in UTAH were lower than normal. Larvae ranged light to medium in Maricopa, Pinal, and Yuma Counties, ARIZONA, from January through May. Flights were heavy in August and September in Graham, Maricopa, Pinal, and Yuma Counties. Larvae were heavy in October and November in Maricopa and Yuma Counties. Alfalfa caterpillar was lower than normal in UTAH. Adults were abundant and larvae averaged over 2 per sweep in many fields of alfalfa in southern Eddy County, NEW MEXICO, during May. Alfalfa caterpillar caused occasional damage to alfalfa in OKLAHOMA and caused little damage in KANSAS in 1968. This pest was uniformly light throughout the season in VIRGINIA.

CABBAGE LOOPER (*Trichoplusia ni*) was heavy on alfalfa in Pinal County, ARIZONA, in late August, September, and early December, and in Yuma County in late September and late November. ZEBRA CATERPILLAR (*Ceramica picta*) was light on alfalfa in Churchill, Douglas, Lyon, and Pershing Counties, NEVADA, beginning in late June. In September and early October, the only heavy damage occurred in Lyon County. W-MARKED CUTWORM (*Spaelotis clandestina*) was heavy in alfalfa in central WISCONSIN, particularly in older fields with high winter kill.

Larvae of a PSYCHID MOTH (*Apterona crenulella*) damaged alfalfa in Siskiyou and Modoc Counties, CALIFORNIA, for the first time. GARDEN WEBWORM (*Loxostege similalis*) infestations were common in ARKANSAS but economic in only a few fields. Infestations of *Loxostege* spp. did not reach economic levels in most areas of KANSAS and caused no concern. A LEAF ROLLER MOTH (*Sparganothis* sp.) caused severe damage to birdsfoot-trefoil seed fields in VERMONT. Losses ranged from 15 to 20 percent.

SOYBEANS

Highlights:

BEAN LEAF BEETLE was heavy in some Black Belt counties of Alabama and was moderate to heavy in some areas of Oklahoma. MEXICAN BEAN BEETLE was serious in isolated fields in southwestern Alabama; injury was lighter than in 1967 in Virginia but was heavy on the southern Eastern Shore of Maryland. GREEN CLOVERWORM reached outbreak levels in Michigan and was the heaviest ever observed in northern and central Indiana, but damage was not economic. Populations were also the heaviest in Michigan since 1964, but controls were not necessary.

BEAN LEAF BEETLE (Cerotoma trifurcata) was very heavy in several Black Belt counties of ALABAMA, especially Greene, Sumter, and Marengo, where 50 percent or more of the leaves were destroyed. Populations ranged moderate to heavy in northeastern, east-central, and southeastern OKLAHOMA from mid-September to early October. In July and August light numbers infested many fields in eastern KANSAS. Leaf feeding was noticeable but not severe in many fields. Bean leaf beetle was light in ILLINOIS but moderate in some fields. Damage was not economic. Bean leaf beetle caused very little damage in VIRGINIA. Adult damage ranged light to heavy throughout southern MARYLAND and light to moderate on the Eastern Shore. Heavy numbers in a few fields late in the season did not affect yields. Damage was heaviest in St. Marys County where half of a 15-acre stand was lost before the plants measured 6 inches. Very little acreage needed sprays specifically for bean leaf beetle.

MEXICAN BEAN BEETLE (Epilachna varivestis) was serious in isolated fields in southwestern ALABAMA. Numbers were lighter elsewhere. Controls were required during August in the southern counties of south-central and southeastern INDIANA where defoliation ranged 50-75 percent in a few scattered fields. In these districts populations and damage have gradually increased for the past 3 years. Mexican bean beetle was not noticeable on soybeans in MICHIGAN. Damage by this pest was lighter than in 1967 in VIRGINIA, but pockets of severe injury to untreated soybeans did occur. Damage in MARYLAND was heavy in 2 southern counties on the Eastern Shore, and controls were necessary. Light to moderate damage was noted in other areas of the State.

Larvae of a CERAMBYCID BEETLE (Dectes spinosus) infested up to 90 percent of the soybeans in 3 counties in the bootheel area of MISSOURI in October.

GREEN CLOVERWORM (Plathypena scabra) caused heavy "ragging" of soybean leaves in ALABAMA, but the extent of damage was questionable. Larval infestations were general on soybeans in Haywood County, TENNESSEE. Damage was variable on leaves and light to small pods. Green cloverworm moths were active from early February to late November in ARKANSAS. The earliest larvae appeared in late March. Infestations were not economic. Larvae of green cloverworm and a NOCTUID MOTH (Pseudoplusia includens) damaged soybeans in southeastern and east-central OKLAHOMA during late September and early October. Defoliation ranged as high as 50 percent in many fields in southeastern and east-central KANSAS in August and September. Some moderate defoliation occurred in southeastern NEBRASKA from late August to September. Larvae were first reported in IOWA the week ending July 19. Populations increased the next 2 weeks. Little damage occurred although the upper leaves were ragged. Green cloverworm larvae reached outbreak levels on soybeans in MINNESOTA during August. This was unusual and the first occurrence since 1957. In July the first damaging numbers were found on canning peas in the south-central area. In early August reports of damage were numerous in the 2 southernmost tiers of counties. By mid-August damaging numbers were found in all southern districts and were extending into the central district. Damage was severe in some fields. Counts of 30 larvae per row foot were reported. Most damage occurred on the tops of soybean plants. Soybeans and canning peas were treated in the southern districts, but in many cases the advanced maturity of the soybeans, the numbers of larvae, and the amount of damage did not justify spraying. Fungus disease was found in McLeod County. Green cloverworm is not expected to be a perennial problem on soybeans or peas in Minnesota.

Green cloverworm larvae in ILLINOIS were a concern until controlled by a fungus disease. During the last of July and the first of August, larvae averaged 3 per row foot. The northwestern district had the highest numbers with 12 per row foot in some fields and an average of 4 per row foot. Larvae in the central and northern districts of INDIANA were the heaviest ever observed, but damage remained below economic levels. During the first 3 weeks of August larvae ranged 1 per 5 row feet to 4 per row foot in the northern and central areas, and defoliation ranged 10-15 percent in the most heavily infested fields. The highest counts were obtained in the northwestern area. Although numbers in MICHIGAN were the highest since 1964, the level of damage remained below any control need.

Damage accumulated from each brood. The first adult was detected on May 15 at the Lenawee County blacklight station. Moderately high adult numbers developed during August and September. In VIRGINIA moderate to heavy numbers in late summer caused only light damage.

VELVETBEAN CATERPILLAR (*Anticarsia gemmatalis*) was a pest in many isolated fields in coastal ALABAMA, with the heavier infestations in the extreme southwestern area. Infestations were not serious farther north into Dallas, Montgomery, and Lee Counties.

Mixed populations of CABBAGE LOOPER (*Trichoplusia ni*) and a NOCTUID MOTH (*Pseudoplusia includens*) probably damaged soybeans in the coastal counties of ALABAMA. Populations were lighter in the central and northern areas. *Pseudoplusia includens* was the predominant looper on soybeans throughout Alabama. In ARKANSAS *P. includens* was heavy for the first time in one area. Populations of 15-20 per row foot caused complete defoliation. Virus and fungus diseases reduced larval numbers but did not prevent a buildup.

FALL ARMYWORM (*Spodoptera frugiperda*) was much lighter than in 1967 in ARKANSAS and was not economic. BEET ARMYWORM (*S. exigua*) larvae damaged seedlings in Cochise and Yuma Counties, ARIZONA, in late May and early June.

SOUTHERN GREEN STINK BUG (*Nezara viridula*) was heavy in a few fields in the Northern Neck area of VIRGINIA in late summer. Southern green stink bug and BROWN STINK BUG (*Euschistus servus*) nymphs and adults became pests after pod development in coastal counties of ALABAMA. Damage was less than in 1966 and about the same as in 1967. GREEN STINK BUG (*Acrosternum hilare*) remained light throughout the season and caused little concern in KANSAS.

GRASSHOPPERS (*Melanoplus* spp.) caused light damage around margins of many fields adjacent to roadsides and pastures on the Eastern Shore of MARYLAND. These pests caused 40 percent loss of foliage on 15 acres of soybeans in Queen Annes County. *M. femurrubrum* and *M. differentialis* adults ranged 3-9 per square yard on roadsides and in weedy soybean fields in west-central and central INDIANA during early September. Defoliation ranged up to 15 percent in the most heavily infested fields.

STRAWBERRY SPIDER MITE (*Tetranychus turkestani*) was heavy on experimental soybeans in Yuma County, ARIZONA, in early July and early September. Controls were successful. Damage by SPIDER MITES (*Tetranychus* spp.) occurred in some fields in southwestern TENNESSEE, and dry weather in VIRGINIA allowed these pests to build up on soybeans in late summer and fall. Strawberry spider mite ranged light to heavy generally in MARYLAND. Damage appeared heaviest on the Eastern Shore where 60-100 acres were completely defoliated. Yellowed border rows were common in this area. Spider mites, mostly strawberry spider mite, were abundant in DELAWARE by late July and caused much damage through most of Kent and Sussex Counties after late July.

PEANUTS

GRANULATE CUTWORM (*Feltia subterranea*) caused light damage in several southeastern counties of ALABAMA in 1968, similar to 1967 but less than in 1966. VELVETBEAN CATERPILLAR (*Anticarsia gemmatalis*) was very light in Alabama and fed on leaves of peanuts in mixed populations with cutworms, corn earworm, and tobacco budworm. In north-central FLORIDA a complex of velvetbean caterpillar, FALL ARMYWORM (*Spodoptera frugiperda*) and *Heliothis* spp. was severe on peanuts in June.

LESSER CORNSTALK BORER (*Elasmopalpus lignosellus*) larvae were severe in northwestern FLORIDA. The outbreak and damage in the 9-county peanut growing area of ALABAMA was unusual and extensive. Lesser cornstalk borer ranged medium to heavy in one east-central and 2 north-central counties of TEXAS during August and early September.

RED-NECKED PEANUTWORM (Stegasta bosqueella) was light in Eastland County, TEXAS, in mid-August. Damage ranged moderate to heavy in south-central and southwestern peanut areas of OKLAHOMA in July and August.

BURROWING STINK BUGS (Pangaeus bilineatus and Tominotus cummunis) damaged peanuts in a few fields of southeastern ALABAMA in 1968. These pests have been present in the State for many years. They were serious in 1966 but were not a problem in 1967. P. bilineatus was detected on this crop in Frio County, TEXAS, in 1968 and caused 6-23 percent damage.

TOBACCO THRIPS (Frankliniella fusca) was damaging throughout the 9-county peanut area of ALABAMA; controls were generally necessary. Frankliniella spp. caused no serious damage in most areas of OKLAHOMA.

Damage by SPIDER MITES (Tetranychus spp.) in ALABAMA was of more concern than usual. These pests damaged peanuts in Payne County, OKLAHOMA, in late August.

COTTON

Highlights:

BOLL WEEVIL was heavy in Alabama and Tennessee. Large numbers entered hibernation in the fall in Alabama. BOLLWORM and TOBACCO BUDWORM were major pests in Alabama and built up in Missouri. Bollworm was occasionally heavy in areas of Oklahoma. CABBAGE LOOPER was the main problem on cotton in Arizona. BEET ARMYWORM damaged much seedling cotton in New Mexico and was heavy on early cotton in areas of Texas. LYGUS BUGS required controls in some areas. SPIDER MITES were severe in Tennessee and heavier than in the past several years in Alabama.

BOLL WEEVIL (Anthonomus grandis) ranged light to heavy throughout TEXAS with very heavy numbers in the south-central area and noneconomic numbers in the High Plains and Trans-Pecos areas. Damage ranged light to moderate in most areas of OKLAHOMA throughout the season. However, from late July to mid-September occasional heavy damage was reported in a few south-central and southwestern counties. Populations in ARKANSAS were much lighter in 1968 than in 1967. Few fields required treatment before August. Boll weevil was low again in MISSOURI in 1968. The heaviest infestation was located in the extreme southwestern corner of Dunklin County. Lighter infestations were found along the western edge of Dunklin and Stoddard Counties and in scattered areas of Butler County. One control application was made to 799 acres. Weevils began feeding on terminal buds in the lower tier of counties in TENNESSEE in early June, and overwintered adults were numerous by mid-June. Some punctured squares were found by late June. Controls and unfavorable weather kept overwintered adults low. By mid-July punctured squares ranged up to 50 percent (averaged 32 percent in untreated fields) in the southern counties. By August 1 the first generation "hatch out" was completed, egg laying became heavy, and punctured squares averaged 26 percent. In the second week of August, punctured squares ranged 8-95 percent, and in the southern tier of counties averaged 34 percent. Migration northward began from "cut out" fields in mid-August. Punctured squares ranged 10-95 percent. Migration northward and damage to late cotton and small bolls continued throughout the area into September. Boll weevil damage throughout ALABAMA was about equal to that of 1967 and was much worse than in the period 1963-1966. Survival of first-generation eggs, larvae, and pupae was very high throughout the State. Overwintered weevils emerged in large numbers. Weevil "hatch out" in June and July was very heavy in all areas. Although squaring was several weeks late in the northern area, overwintered weevils survived to deposit many eggs in June and July. Very heavy numbers entered hibernation in 1968. For Boll Weevil in the Texas High Plains and Boll Weevil Complex see CEIR 19(7):97.

BOLLWORM (Heliothis zea) was not the overall problem of 1967 in CALIFORNIA although it was very prevalent. Bollworm was low throughout ARIZONA during the entire season. Most larvae were killed by controls used for Pectinophora gossypiella (pink bollworm). Scattered, light to heavy infestations of BOLLWORMS (Heliothis spp.) caused minor to moderate damage on cotton in southern NEW MEXICO. These pests were not serious in 1968. Bollworm and TOBACCO BUDWORM (Heliothis virescens) occurred throughout the cotton areas of TEXAS. Phosphate-resistant strains were detected in the Rio Grande Valley. Very light numbers were reported from the High Plains area with heavier numbers generally present in the southern area and the Trans-Pecos region. Bollworm ranged light to moderate on cotton in most areas of OKLAHOMA from late June to late September but was occasionally heavy in the central, south-central, southwestern, and west-central sections of the State. Tobacco budworm comprised 60-75 percent of the populations in 2 central counties in mid-September.

Bollworm and tobacco budworm were much lighter in ARKANSAS in 1968 than in 1967. Because the usual late July outbreaks did not occur, very few treatments were applied before mid-August. H. virescens accounted for 10.2 percent of the 1,099 larvae determined. This percentage is higher than in past years because more samples were taken in the southwestern area where tobacco budworm makes up 67 percent of the population. Tobacco budworm problems are increasing on cotton in this area because of insecticide resistance. Both species began a slow buildup in MISSOURI in mid-July that continued until the first killing frost. By the second week of September, larvae infested 75 percent of the fields. Chemical controls were applied to only 12.2 percent of the 14,431 acres scouted, including acreage requiring more than one application. In TENNESSEE Heliothis spp. eggs and larvae per 100 cotton terminals ranged 1-11 in late June, 1-16 in late July, and 2-20 in mid-August. By late August, egg laying subsided somewhat. Damage remained heavy in late cotton. Bollworm and tobacco budworm became major pests of cotton throughout ALABAMA following a buildup of 2 or more generations on clover, vetch, and corn. The problem was about as serious as in 1967 but less so than in 1965-1966.

CABBAGE LOOPER (Trichoplusia ni) and a NOCTUID MOTH (Pseudoplusia includens) began appearing on cotton in ALABAMA as early as June. By August, larvae were numerous and feeding on leaves. No special controls were applied. Cabbage looper larvae appeared about mid-June in TENNESSEE. Throughout the cotton area, foliar injury was not heavy enough to justify control for this pest alone. By late August, disease reduced populations. P. includens larvae approached economic levels in ARKANSAS in early September, the first time this species has been numerous on cotton in the State. Cabbage looper was not economic in most areas of OKLAHOMA. Both species damaged cotton in some sections of TEXAS. Cabbage looper was the main problem in most cotton fields in ARIZONA from May through mid-October. Special controls were required for this pest. Cabbage looper also required controls in some CALIFORNIA areas.

BEET ARMYWORM (Spodoptera exigua) damaged young cotton in CALIFORNIA. During May larvae were severe (6-12 per plant) on young cotton in Yuma County, ARIZONA, heavy in Cochise and Graham Counties (up to three treatments applied), and moderate in Maricopa and Pinal Counties. Normally a minor pest in NEW MEXICO, beet armyworm larvae damaged many seedling fields in the Mesilla and Pecos Valleys during May and June. Heavy numbers on early cotton in TEXAS required chemical controls in the El Paso, Trans-Pecos, South Plains, and Rolling Plains areas.

EUROPEAN CORN BORER (Ostrinia nubilalis) damaged half of a 60-acre field of early squaring cotton in Autauga County, ALABAMA. This field had been in pasture sod for several years. European corn borer larvae were observed in cotton bolls and stalks in MISSOURI. Heavy boll damage was observed in one field of late-planted cotton in Stoddard County. CUTWORMS, mainly Peridroma saucia (variegated cutworm) caused light to heavy damage to marginal rows of cotton in scattered areas of southeastern Missouri. In most cases migration was traced to volunteer legumes growing along ditchbanks. COTTON LEAF PERFORATOR

(*Bucculatrix thurberiella*) was severe on desert area cotton in CALIFORNIA. Treatment for other pests resulted in outbreaks of this pest.

LYGUS BUGS (*Lygus* spp.) were variable in cotton areas of CALIFORNIA. Controls were required for these pests in NEVADA. However, less acreage was treated in 1968 than in 1967. Predators and parasites kept these pests at low levels. In ARIZONA, populations of a FLEAHOPPER (*Spanogonicus albofasciatus*) from May through July and lygus bugs from June through mid-July ranged moderate to heavy in all cotton counties. From mid-July through August lygus bugs were high in untreated fields. Damage by *S. albofasciatus* and COTTON FLEAHOPPER (*Pseudatomoscelis seriatus*) in NEW MEXICO appeared somewhat lighter in 1968 than in past years. Nevertheless, controls were applied. Cotton fleahopper damaged cotton in some sections of TEXAS. *P. seriatus* infested cotton in west-central, southwestern, and south-central OKLAHOMA from mid-June through July. The heaviest populations (10-60 per 100 feet) occurred in the southwestern area during late June. TARNISHED PLANT BUG (*Lygus lineolaris*) and *Neurocolpus nubilus* became economic on cotton in northeastern ARKANSAS in August. Loss of and damage to the small bolls, not the squares, were the problems. Tarnished plant bug infested most fields in TENNESSEE with increasing damage to pinhead squares during late June. Early July infestations reached control levels in many fields. Through mid-August damage, especially in rank cotton, continued about the same level. In MISSOURI a complex of cotton fleahopper, tarnished plant bug, and RAPID PLANT BUG (*Adelphocoris rapidus*) infested as much as 97.4 percent of the 14,431 acres scouted. Plant bugs reached economic levels in very few fields. Controls were applied to only 100 acres.

COTTON APHID (*Aphis gossypii*) ranged moderate to heavy on young cotton in Cochise, Graham, Maricopa, Pima, and Pinal Counties, ARIZONA, from mid-April through mid-May. This aphid damaged cotton in some sections of TEXAS. Populations in southwestern OKLAHOMA were heavy in scattered fields in late June. Only isolated infestations occurred on cotton seedlings in MISSOURI. Beneficial insects kept cotton aphid under control in Missouri and only 100 acres were treated. Throughout ALABAMA early counts of 1-25 per plant infested 2 to 4-leaf cotton. Large numbers of *Hippodamia convergens* (convergent lady beetle) controlled these cotton aphid populations in 10-20 days.

WESTERN FLOWER THRIPS (*Frankliniella occidentalis*) curled leaves on young untreated cotton plants in Graham, Maricopa, Pima, Pinal, and Yuma Counties, ARIZONA, from mid-April to mid-May. *Frankliniella* spp. populations were not economic in most areas of OKLAHOMA. Although lighter in 1968 than in 1967, thrips were heavier than normal in ARKANSAS. The problem occurred mainly on late cotton. In MISSOURI infestations of TOBACCO THRIPS (*F. fusca*), FLOWER THRIPS (*F. tritici*), and *Sericothrips variabilis* were again fairly widespread but much lighter than in 1967. Chemical controls were applied to 7,070 of the 14,431 acres scouted. The treated acreage included 2,580 acres to which systemic insecticides were applied at planting time. Thrips, mostly tobacco thrips and flower thrips, infested cotton throughout ALABAMA, especially the 2 to 6-leaf stage. Control efforts were general in the northern area and extended into much of the central area.

SPIDER MITES were not so damaging as in 1967 in CALIFORNIA; chemical controls for other pests were responsible for buildups. While controls were required for spider mites in NEVADA, less acreage was treated in 1968 than in 1967. Predators and parasites kept these pests at low levels. Spider mites, mainly STRAWBERRY SPIDER MITE (*Tetranychus turkestani*), infested 7.04 percent of the scouted cotton acreage in MISSOURI. Spot and strip treatments were effective. Spider mite damage in TENNESSEE became more noticeable in untreated fields by mid-July. By late July, injury was severe throughout the cotton area. During mid-August, infestations continued to increase and the worst conditions in several years occurred in some areas. In late August untreated fields were completely defoliated. TWO-SPOTTED SPIDER MITE (*T. urticae*) and other mites were confined mainly to central and northern ALABAMA. Although not so severe as in 1957-1962, problems during the dry season of 1968 were worse than in the past 4-5 years, especially in the central area. Widespread use of preplant systemic insecticides contributed to early and midseason suppression.

TOBACCO

Highlights:

Several CUTWORMS were troublesome on tobacco in Florida, but POTATO TUBERWORM infestations decreased. TOBACCO FLEA BEETLE was heavy in areas of Maryland, but GREEN PEACH APHID was the major tobacco pest in the State.

Several CUTWORMS were troublesome on tobacco in FLORIDA. Light to moderate numbers of BLACK CUTWORM (Agrotis ipsilon), VARIEGATED CUTWORM (Peridroma saucia), and GRANULATE CUTWORM (Feltia subterranea) damaged young transplants of flue-cured tobacco. These pests accounted for 1.0 percent of the $1,488,240 insect loss to this crop in Florida. These 3 species caused moderate to severe damage to young transplants of cigar-wrapper tobacco. Populations were heavy, but good controls checked the amount of damage. Loss amounted to 0.5 percent of the $784,686 insect loss. CABBAGE LOOPER (Trichoplusia ni) was light on cigar-wrapper tobacco in Florida with most damage occurring early in the season. Loss was 0.3 percent.

BUDWORMS (Heliothis spp.) caused light damage to tobacco in MARYLAND, but no controls were needed. HORNWORMS (Manduca spp.) ranged 0-6 per 50 plants in MARYLAND. In an unusually heavy infestation in St. Marys County, larvae ranged 30-45 per 50 plants. Very few controls were applied specifically for hornworms except in St. Marys County. In VIRGINIA, Manduca sp was generally light on tobacco with increases early and late in the season.

POTATO TUBERWORM (Phthorimaea operculella) was light on cigar-wrapper tobacco in FLORIDA. Populations decreased from those of 1967. This pest accounted for 0.1 percent of the loss to this crop. Infestations on flue-cured tobacco were also lighter than in 1967, and light damage resulted. Loss to this crop by potato tuberworm amounted to 0.4 percent. Populations did not increase in 1968 as expected.

TOBACCO FLEA BEETLE (Epitrix hirtipennis) caused light losses to cigar-wrapper tobacco in FLORIDA. Loss was 0.3 percent. Losses to flue-cured tobacco were negligible. This flea beetle caused heavy damage to new transplants in VIRGINIA, but damage to the marketable crop was very light. Second-generation adults appeared in August. Tobacco flea beetle was heavy on tobacco in St. Marys, Charles, and Anne Arundel Counties, MARYLAND. In some fields where feeding was heavy, 5-10 percent of newly set plants had to be replaced. Late season injury remained light to moderate. No controls were applied to mature tobacco in Maryland. Tobacco flea beetle adults ranged 1-7 per tobacco leaf by mid-July in southern INDIANA and 4-21 per leaf by late August. Controls were warranted in a few plantings in the southeastern area.

SOUTHERN POTATO WIREWORM (Conoderus falli) was a problem on cigar-wrapper tobacco in FLORIDA where no controls were made or applications were inadequate. The number of wireworm problems was about the same as in 1967. This pest accounted for 0.1 percent of the loss to this crop. Southern potato wireworm and TOBACCO WIREWORM (C. vespertinus) were heavy in some fields of flue-cured tobacco in the State. These pests accounted for 0.6 percent of the loss to this crop.

VEGETABLE WEEVIL (Listroderes costirostris obliquus) caused light damage to cigar-wrapper tobacco in the plant beds in FLORIDA. Damage to flue-cured tobacco was negligible.

A FALSE CHINCH BUG (Nysius raphanus) increased slightly and was noted in about 25 acres of cigar-wrapper tobacco in FLORIDA. Damage was light, but the potential for damage is greater than for Myzus persicae (green peach aphid) at this time. This chinch bug appears to be a dry weather pest of tobacco in Florida. It accounted for 0.1 percent of the loss in 1968.

GREEN PEACH APHID (Myzus persicae) was the major pest of tobacco in MARYLAND in 1968. Infestations varied considerably from field to field. Controls were applied to most of the 36,000 acres in the State. Populations in VIRGINIA increased early in the season but declined in July, probably due to unfavorable weather. Damage was lighter than in 1967. Green peach aphid was numerous in some fields of flue-cured tobacco in FLORIDA; however, spot treatments minimized damage. This aphid accounted for 0.5 percent of the loss to this crop. Green peach aphid caused light damage to some cigar-wrapper tobacco in Florida, accounting for 0.1 percent of the loss to this crop.

RED-LEGGED GRASSHOPPER (Melanoplus femurrubrum) and AMERICAN GRASSHOPPER (Schistocerca americana) caused light damage in isolated fields of flue-cured tobacco in FLORIDA. Unspecified grasshoppers caused moderate damage in some fields of tobacco in eastern TENNESSEE due to harvesting of adjacent hayfields.

Weather continued from page 146.

WEATHER OF THE WEEK ENDING FEBRUARY 24

HIGHLIGHTS: Winter storms disrupted power and communication, clogged highways and mountain passes, closed schools, and, in some areas, increased the likelihood of spring floods.

PRECIPITATION: A storm system off the northern Atlantic coast on Monday, February 24, dumped heavy snow over northern New England before tapering off about midweek. By Wednesday, 2 feet of snow had fallen at Boston, Massachusetts, and 3 feet at St. Johnsbury, Vermont. In some areas, the snow fell continuously for more than 100 hours and many schools remained closed the entire week. The storm increased the February snowfall totals at numerous stations sufficiently to set new records for the month of February. Another storm about 300 miles off the Pacific coast of California on Monday soaked coastal sections with heavy rain and dumped heavy snow in the nearby mountains. The snow closed some of the highway passes in the Sierras and the rain sent some of the rivers above flood stage. Some flooding and mud slides occurred in southern California. The 2 to 3-foot increase in snowpack in the Sierras brings it to near record depth and increased the flood potential. Clearing began about midweek in the Far West but snow continued in the Great Basin and began in the central and southern Rocky Mountains and spread to the northern and central Great Plains. By Friday morning, 17 inches of new snow had fallen at Aberdeen, South Dakota, increasing the depth to 25 inches. A mixture of snow, freezing rain, and freezing drizzle south of the snow area iced communication and power lines, interrupting power and communication, and glazed roads and highways making driving hazardous. The weekend brought three more storms. One of these moved northward along the Atlantic coast, unloaded up to a foot or more of new snow to parts of New York and New England and generally lesser amounts to other northeastern States. Another weekend storm deposited 8 to 10 inches or more of new snow in the Texas Panhandle and in nearby portions of Oklahoma and Kansas with rain southeastward to the gulf. The third weekend storm, located off the Pacific coast, brought generous rain to the coast with snow in the mountains of northern and central California.

TEMPERATURE: Bitter cold weather continued in Montana with much of the central part of the State averaging 10° to 18° colder than normal. The southern Great Plains warmed. The northern Great Plains continued pleasant for the fourth consecutive week and it was the third cool week in the Southeast. (Summary supplied by Environmental Data Service, ESSA.)

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